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Supreme Court of the United States

OCTOBER TERM, 1982

UNITED STATES NUCLEAR REGULATORY COMMISSION AND THE UNITED STATES OF AMERICA,
Petitioners,

v.

PEOPLE AGAINST NUCLEAR ENERGY, *et al.*,
Respondents.

On Petitions for Writs of Certiorari to the United States Court of Appeals for the District of Columbia Circuit

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BRIEF OF *AMICUS CURIAE* AMERICAN PSYCHOLOGICAL ASSOCIATION IN SUPPORT OF RESPONDENTS AND IN OPPOSITION TO THE PETITIONS FOR WRITS OF CERTIORARI

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INTEREST OF *AMICUS CURIAE*

The American Psychological Association (hereafter "APA"), a nonprofit scientific and professional organization founded in 1892, is the major association of psychologists in the United States. The APA has more than 55,000 members and includes the vast majority of psychologists holding doctoral degrees from accredited universities in the United States.

One of APA's major functions has been to promote psychological research, to improve research methods, and to disseminate information regarding human psychological behavior through meetings, scientific publications and special reports. A substantial and growing number of APA's members, including over 500 of its members who belong to the Division of Population and Environmental

Psychology, are systematically studying the psychological effects of environmental stimuli. The APA wishes to inform the Court about current research, data, and methods available to identify, quantify and predict the psychological effects of environmental factors relevant in this case.

Counsel for the parties have consented to the filing of this *amicus* brief. Their letters of consent have been filed with the Clerk.

SUMMARY OF ARGUMENT

Both petitions are premature. Both raise legal issues and assert conflicts between circuits that are not likely to be presented when a factual record is developed in this case.

Petitioners in No. 81-2399 (hereafter "Utilities") contend that non-measurable effects are not cognizable under the National Environmental Policy Act, 42 U.S.C. §§ 4321 *et seq.* (hereafter "NEPA"), and that the Court of Appeals therefore erred in ruling, as a matter of law that, in limited circumstances, psychological effects are cognizable under NEPA whether they are measurable or not. Petitioners in No. 82-358 (the United States and the Nuclear Regulatory Commission, hereafter the "Commission") assume that psychological effects can be cognizable under NEPA, but only if there is a "causal nexus" between those psychological effects and the effects on the *physical* environment of the federal action under review. Asserting that there is no such causal nexus on the facts of this case, the Commission contends that the Court of Appeals erred in ruling, as a matter of law, that the psychological effects alleged by respondents are cognizable under NEPA. Both rulings are alleged to conflict with rulings in other circuits.

If psychological effects are, in fact, measurable at Three Mile Island (hereafter "TMI"), and if there is, in fact, a causal nexus between psychological effects and the effects of the federal action on the physical environment, the legal issues raised by the Utilities and by the

Commission would not be presented by this case. The record before the Court contains no evidence on those factual issues, and the Commission has not decided those issues. However, *amicus* contends, and the evidence currently before the Commission in a related proceeding in this case confirms, that psychological effects are, in fact, measurable at TMI, and that there is, in fact, a causal nexus between psychological effects and the effect of the federal action on the physical environment.

In these circumstances, the Court need not, and should not, on this record decide the legal issues raised by the petitioners since development of a factual record may make resolution of these legal issues unnecessary. Similarly, development of the factual record may eliminate the alleged conflict between the holding of the Court of Appeals and decisions in other circuits.

ARGUMENT

THE COURT SHOULD NOT DECIDE THE ISSUES RAISED BY THESE PETITIONS ON THE BASIS OF THE PRESENT FACTUAL RECORD.

As *amicus* will show, it is likely that the two legal issues raised by petitioners will not need to be decided, and the asserted conflicts with other circuits will not exist, once the Commission has addressed the critical factual issues underlying those legal issues. This Court should decline to resolve the legal issues until a factual record is developed. *See Kennedy* v. *Silas Mason Co.*, 334 U.S. 249, 257 (1948); *Phillips* v. *Martin Marietta Corp.*, 400 U.S. 542, 544 (1971) (per curiam); *Dombrowski* v. *Eastland*, 387 U.S. 82 (1967); *Board of Education, Island Trees Union Free School District* v. *Pico*, —— US. ——, 50 U.S.L.W. 4831 (June 25, 1982) (White, J., concurring).

The majority of the Court of Appeals panel held that certain types of psychological stress—post-traumatic anxieties, accompanied by physical effects and caused by fears of recurring catastrophe—are "health" effects that

must be considered under NEPA in connection with the Commission's decision whether to permit the restart of a reactor located at the site of a recent, serious nuclear accident.[1]

The Utilities assert that psychological effects are never cognizable under NEPA because, in their opinion, psychological effects can never be measured.[2] They contend that the decision below conflicts with decisions of other courts of appeals and with the intent of Congress insofar as it holds that NEPA requires consideration of effects even if those effects cannot be measured.

The Commission does not assert that psychological effects are not cognizable under NEPA—indeed, it assumes that such effects *are* cognizable under NEPA. The Commission contends that, for an effect to be cognizable under NEPA, there must be a "causal nexus" between the effect in question and the effects of the proposed action on the natural environment. The Commission asserts that such a nexus is lacking.[3]

The arguments of both the Utilities and the Commission are based on assumptions about the facts in this case. The Utilities assert that psychological effects at Three Mile Island cannot be measured, and thereby perceive a conflict between the decision below and decisions of other courts of appeals which they characterize as holding that nonquantifiable effects are not cognizable under NEPA. Util. Pet. 10-15. The Commission asserts that a causal nexus is lacking between the effects of the proposed federal action at TMI on the natural or physical environment and the psychological stress suffered by resi-

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[1] *People Against Nuclear Energy* v. *United States Nuclear Regulatory Commission*, 678 F.2d 222 (D.C. Cir. 1982).

[2] Petition of Metropolitan Edison Company, Jersey Central Power & Light Company and Pennsylvania Electric Company 10-15 (hereafter "Util. Pet.").

[3] Petition of Nuclear Regulatory Commission and the United States for a Writ of Certiorari to the United States Court of Appeals for the District of Columbia Circuit, 17, 27-29 (hereafter "NRC Pet.").

dents of the surrounding area. NRC Pet. 20-22. The Commission therefore concludes that the panel below erroneously interpreted NEPA to apply to psychological effects that are not in the Commission's view caused by an effect of the proposed action on the natural or physical environment.

These factual assertions, however, find no support in the record. Because of the procedures used by the Commission in this case, the agency record reviewed by the Court of Appeals, and which petitioners seek to bring before this Court on writs of certiorari, contains no factual evidence, and no analysis of the factual allegations that are in the record. There is, therefore, no assurance in the administrative record that the legal issues raised by petitioners are necessarily or actually presented for review. Indeed, *amicus* contends that petitioners' factual assertions regarding the measurability and causation of psychological effects are incorrect. Those issues, in any event, are now being considered by the Commission in an ongoing proceeding it initiated to comply with the judgment and order of the Court of Appeals. This Court should deny the present petitions and await completion of that proceeding before addressing the legal questions presented by the Utilities and the Commission.

A. The Critical Factual Issues Involved in This Case Have Not Yet Been Resolved.

In the wake of the serious accident at the TMI-2 reactor, the Commission directed its Atomic Safety and Licensing Board (hereafter "Licensing Board") to hold a hearing on whether to allow restart of the undamaged TMI-1 reactor.[4] The Commission recognized that the psychological impact of the restart on people living nearby was a matter of "real and substantial concern,"[5] but it did *not* instruct or authorize its Licensing Board either to receive factual evidence on the psychological impact

[4] Metropolitan Edison Co. (Three Mile Island Nuclear Station, Unit No. 1) CLJ-79-8, 10 NRC 141 (1979).

[5] *Id.*

question or to analyze the factual allegations submitted to the Board on that question. The Commission was unsure whether psychological impact was of any legal relevance to the restart proceedings. Accordingly, the Commission directed its Licensing Board only to receive factual *allegations* and legal briefs directed to the issue and to certify the question to the full Commission for decision.

The Licensing Board received factual allegations from respondents that restarting TMI-1 would cause serious psychological stress to the residents of the surrounding area.[6] The Licensing Board also received briefs from the parties on whether psychological stress was legally relevant to the restart proceedings. It did *not* receive factual evidence on the psychological impact issue or engage in analysis of the factual allegations. Instead, it certified the question whether psychological stress was legally relevant to the full Commission, together with its recommendation that respondents' factual allegations did establish an issue of legal relevance on which the Licensing Board should receive factual evidence.[7]

The Commission effectively overruled the Licensing Board and determined that psychological impact was not legally relevant to the restart proceedings. Thus, neither the Licensing Board nor the full Commission ever received or analyzed factual evidence relating to the issue of psychological harm resulting from the restart of TMI-1.

It is the Commission's refusal to permit evidence to be received in support of respondents' allegations of psychological harm that was reviewed by the Court of Appeals. Thus, like the Commission, the Court of Appeals had no factual record before it on the question of psychological harm. The court confined its holding to the legal proposition that respondents' allegations of post-

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[6] Util. Pet. App. 115a-116a.

[7] Metropolitan Edison Co. (Three Mile Island Nuclear Station, Unit 1) LPB-80-8, 11 NRC 297 (1980).

traumatic stress accompanied by physical effects and caused by fears of recurring catastrophe were cognizable under NEPA. Thus, the record does not contain any factual evidence on the issues of whether psychological stress of TMI residents is measurable, and whether there exists a causal nexus between the effect of the federal action on the physical environment at TMI and the psychological stress which respondents contend those living near the reactor would suffer.

The Commission has reopened its docket, in a phase of this proceeding that is not presently before the Court, for the specific purpose of receiving evidence relevant to the issue of psychological stress in order to determine whether a supplemental environmental impact statement is required under the terms of the Court of Appeals' judgment and order.[8] The Commission, in that proceeding, has attempted to evaluate whether respondents' allegations of significant psychological harm resulting from the TMI-1 restart are supportable—a determination that necessarily requires the Commission to evaluate (1) whether there would actually be a causal nexus between the TMI-1 restart and psychological stress suffered by those living nearby, and (2) whether psychological stress can be measured with sufficient precision to determine whether the stress suffered by people living near the reactor would be significant. The Commission has received a great deal of evidence in this reopened proceeding but has not yet issued a decision.

B. The Factual Record is Not Sufficiently Developed to Determine Whether the Legal Issue Raised by the Utilities is Necessarily and Actually Presented on the Facts of this Case.

The Utilities contend that the decision below conflicts with decisions of other courts of appeals, as well as with the congressional intent underlying NEPA, in that it holds that non-measurable effects are cognizable under

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[8] *See* Commission Order CLI-82-13, *In the Matter of Metropolitan Edison Company, et al.*, Docket No. 50-289 (July 16, 1982).

NEPA. Util. Pet. 10-15. The Utilities further contend, with no support in the record, that psychological effects are not measurable, a contention that was also made by Judge Wilkey in his opinion dissenting from the decision below.

Both the Utilities' and Judge Wilkey's arguments are based on the assumption that psychological effects are not measurable. In fact, however, nothing in the record of this case indicates that psychological effects are unquantifiable. The panel majority did not so hold; its decision was based on allegations made by respondents before the Licensing Board that post-traumatic anxieties, accompanied by physical effects and caused by fears of recurring catastrophe, are measurable. The court also stated that precise quantifiability is not the benchmark for determining when an effect is cognizable under NEPA. 678 F.2d at 229.

Although this Court could conceivably use this case as a vehicle to decide whether non-measurable effects are ever cognizable under NEPA, sound reasons counsel against doing so. As *amicus* will demonstrate below, current scientific research suggests that many psychological stress effects are, indeed, measurable with a considerable degree of reliability. If psychological effects at TMI are measurable, then the legal issue whether NEPA applies to non-measurable effects is not presented in this case, and the alleged conflict between circuits would disappear.

Thus, if the Court were to address the measurability issue now, there is a substantial likelihood that its decision would be shown, on the basis of a more fully developed factual record, to have been unnecessary. Although the Court's decision would not be advisory in an Article III sense, many of the policies underlying the rule against advisory opinions—the need to limit the judicial function to deciding sharply defined issues reflecting real, concrete adversity between the parties—also counsel against deciding the question whether NEPA applies to non-

measurable effects on the basis of the presently available record.

The possibility that psychological stress at TMI is, in fact, measurable is quite substantial. Contrary to the opinion of the dissenting judge below, the assessment of acute psychological effects is neither "ephemeral" nor "speculative." A considerable body of scientific research has established that stress and anxiety predictably result from environmental stimuli which threaten a person's interests or otherwise make strong demands on him.[9] The current scientific consensus is that the severity and duration of acute stress reactions to external environmental stimuli, such as accidents and disasters, can be measured through application of several assessment methodologies.[10]

An individual's psychological state can be measured through application of standardized, reliable and validated assessment instruments. For example, symptoms can be measured by using an instrument such as Symptom Checklist-90, a 90-item multidimensional symptom inventory that assesses the extent to which symptoms such as nausea, headache, nervousness, and loneliness are experienced as bothersome.[11] The inventory yields an

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[9] *See, e.g.*, F. Bates *et al.*, THE SOCIAL AND PSYCHOLOGICAL CONSEQUENCES OF DISASTER (National Academy of Sciences 1963); Hudgens, *Personal Catastrophe and Depression*, STRESSFUL LIFE EVENTS: THEIR NATURE AND EFFECTS (B. Dohrenwend & B. Dohrenwend eds. 1974); Perry, *Detecting Psychopathological Reactions to Disaster*, 7 SOCIAL BEHAVIOR AND PERSONALITY 173 (1979); Perry & Lindell, *The Psychological Consequences of Natural Disasters*, 3 MASS EMERGENCIES 194 (1978).

[10] P. Walker, W. Fraize, J. Gordon & R. Johnson, PROCEEDINGS OF THE WORKSHOP ON PSYCHOLOGICAL STRESS ASSOCIATED WITH THE PROPOSED RESTART OF THREE MILE ISLAND, UNIT 1 (Feb. 1982) (hereafter "Proceedings"); A. Baum *et al.*, CHRONIC AND ACUTE STRESS ASSOCIATED WITH THREE MILE ISLAND ACCIDENT AND DECONTAMINATION, PRELIMINARY FINDINGS OF A LONGITUDINAL STUDY (Draft report submitted to USNRC, 1981).

[11] The SCL-90 and the Minnesota Multiphasic Personality Inventory are objective instruments in widespread use for the assessment

index of global symptom distress (the total number of symptoms experienced as being bothersome) as well as a number of subscales reflecting emotional disturbances and physical or psychological problems. Factor analysis and multivariant regression techniques identify related groups of symptoms which may then be categorized under the traditional categories of depression, anxiety, anger, distress, etc.[12]

Existing states of anxiety can also be measured by comparing the task performance of a stressed subject with population norms.[13] Some psychological states are also evidenced by measurable physiological changes. For example, people who are maintained in a constant state of stress discharge abnormally high amounts of catecholamine in their urine.[14]

It is also possible to examine both the long term chronic stress reactions to natural and technological disasters and anticipatory anxieties in individual cases concerning such events.[15] Although these phenomena have been less fully

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of psychopathology. They are easily administered and yield reliable and valid information about psychological functioning. They have been used effectively in large scale research studies as well as in the assessment of dysfunction in individuals. Derogatis, Rickels & Rock, *The SCL-90 and the MMPI: A Step in the Validation of a New Self-Report Scale*, 128 BRITISH J. OF PSYCHIATRY 280 (1976); Derogatis, Lipman & Covi, *SCL-90: An Outpatient Psychiatric Rating Scale—Preliminary Report*, 9 PSYCHOPHARMACOLOGICAL BULLETIN 13 (1973); W. Dahlstrom & G. Welsh, AN MMPI HANDBOOK: A GUIDE TO USE IN CLINICAL PRACTICE AND RESEARCH (1960).

[12] *See generally* N. Nie, C. Hull, J. Steinbrenner & D. Bent, STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES (1975).

[13] *See, e.g.*, A Baum, R. Fleming & J. Singer, COPING WITH VICTIMIZATION BY TECHNOLOGICAL DISASTER (1982).

[14] *See* A. Baum *et al.*, CHRONIC AND ACUTE STRESS ASSOCIATED WITH THREE MILE ISLAND ACCIDENT AND DECONTAMINATION, PRELIMINARY FINDINGS OF A LONGITUDINAL STUDY (Draft report submitted to USNRC, 1981).

[15] C. Frederick, VIOLENCE AND DISASTER: IMMEDIATE AND LONG TERM CONSEQUENCES (1981).

researched than acute reactions, studies indicate that, especially among certain high risk groups, chronic disabling reactions occur and are aggravated by actual or threatened stressful events.[16] Individuals suffering such reactions have been demonstrated to be more subject to physical ailments and disease than their non-stressed counterparts.[17]

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[16] Bromet & Dunn, *Mental Health of Mothers Nine Months After the Three Mile Island Accident*, 14 URBAN AND SOCIAL CHANGE REVIEW 12 (1981); Kasl, Chisholm & Eskenazi, *The Impact of the Accident at the Three Mile Island on the Behavior and Well-being of Nuclear Workers: Part I. Perceptions and Evaluations, Behavioral Responses, and Work-Related Attitudes and Feelings*, 71 AM. J. OF PUBLIC HEALTH 472 (1981); Kasl, Chisholm & Eskenazi, *The Impact of the Accident at the Three Mile Island on the Behavior and Well-being of Nuclear Workers: Part II. Job Tension, Psychophysiological Symptoms, and Indices of Distress*, 71 AM. J. OF PUBLIC HEALTH 484 (1981).

[17] On the basis of research and clinical findings obtained during more than 50 years of work, it can be stated categorically that psychological stress and physical illness are inextricably interwoven. Psychological problems such as depression, anxiety and personality disorders often first present themselves with physical symptom patterns associated with hypertension, hypoglycemia, dermatological conditions, diabetic neuropathy and a range of other conditions. Similarly, some physical illnesses are first diagnosed as psychological disorders. There is strong evidence that the presence of psychological stress can exacerbate a variety of physical illnesses including cancer, neurological conditions such as multiple sclerosis, and pulmonary disorders such as asthma and emphyzema. Thus, decision makers must consider the effect of increasing environmental stresses, like those involved in human-created or natural disasters, on the large number of people with pre-existing physical conditions. *See generally* Melick, *Life Changes and Illness: Illness Behavior of Males in the Recovery Period of a Natural Disaster*, J. OF HEALTH AND SOCIAL BEHAVIOR 335 (1978); Melick, *Social, Psychological and Medical Aspects of Stress Related Illnesses in the Recovery Period of a Natural Disaster*, DISSERTATION ABSTRACTS INTERNATIONAL 1239 (1976); Rahe, *The Pathway Between Subjects Recent Life Changes and Their Near-Future Illness Reports: Representative Results and Methodologies Issues*, STRESSFUL LIFE

Just as psychological stress can be measured in individuals, its incidence in various populations can be identified, quantified and predicted. With the aid of sophisticated computer programs and statistical methods, psychological epidemiologists are now able to determine, with acceptable reliability, the extent of psychopathology in general and special populations. Using random sampling techniques, validated questionnaire instruments administered by trained personnel, and carefully selected control groups, it is possible to collect data concerning the salient psychological characteristics and functional levels of large groups of people.[18] As in the case of individual psychological evaluations, researchers agree that the most valid data can be obtained through application of several methodologies including psychological and biological assessment and task performance.

Many of the studies of psychological stress at TMI have already been placed in the record of the Commission's ongoing proceeding concerning the psychological stress effects of restarting TMI-1. The Commission and its staff, therefore, have before them a substantial amount of factual material that was not in the record before the Court of Appeals. Thus, the Commission will have an opportunity to determine, in the first instance, whether psychological health effects are sufficiently measurable at TMI so that an assessment is possible whether those effects are significant. Accordingly, this Court should deny the present petitions while awaiting the results of the Commission's ongoing proceeding.

EVENTS: THEIR NATURE AND EFFECTS (B. Dohrenwend & B. Dohrenwend eds. 1974); Richlin, Shale & Rahe, *Five Year Medical Follow-up of Navy POWs Repatriated from Vietnam: Preliminary Results*, U.S. NAVY MEDICINE 19 (1980).

[18] B. Dohrenwend & B. Dohrenwend, SOCIAL STATUS & PSYCHOLOGICAL DISORDER, A CAUSAL INQUIRY (1969); Seisser, *Epidemiology of Life Stress*, 11 PSYCHOLOGICAL MEDICINE 1 (1981).

C. The Factual Record is Not Sufficiently Developed to Determine Whether the Legal Issue Raised by the Commission is Necessarily or Actually Presented on the Facts of this Case.

The Commission, unlike the Utilities, does not assert that psychological effects are not cognizable under NEPA —indeed, it assumes such effects *are* cognizable under NEPA. NRC Pet. 20-21. Instead, the Commission argues that the court below erred in interpreting NEPA as requiring federal agencies to take into account effects which, even if cognizable under NEPA, are not, in the Commission's view, causally connected to the effect on the natural environment stemming from the proposed federal action. The Commission's view appears to be that, for a psychological effect to be cognizable under NEPA, there must be (1) a major federal action (2) that has a direct effect on the natural environment (3) which, in turn, is linked by a "causal nexus" with (4) the psychological effect. The Commission argues that the "causal nexus" factor was lacking in the present case.

As an initial matter, *amicus* agrees with respondents that the Commission's interpretation of NEPA is strained insofar as it requires the federal action to directly affect the "natural" or physical environment (as opposed to the human environment). NEPA was passed for the benefit of human beings; it is concerned with the "human environment", not with the natural environment considered in isolation from any human reactions.

However, one need not disagree with the Commission's interpretation of NEPA in order to conclude that the Court should deny the petition in the present case. Assuming, for purposes of argument, that the Commission's interpretation is correct, it can plausibly be argued that each of the four elements which the Commission seems to believe NEPA requires are present on the facts of this case. First, the decision to permit restart of the TMI-1 reactor is a major federal action, and the Commission does not argue otherwise. *See* NRC Pet. 17-18 n.12. Sec-

ond, restarting the TMI-1 reactor will have an effect on the physical (non-human) environment, through the dramatic alteration of conditions of temperature and pressure within the reactor and through other physical effects of reactor operation. The Commission's own regulations require preparation of an environmental impact statement in connection with the decision whether to grant an operating license to a nuclear plant. *See* 10 C.F.R. § 51.21 (1982). Because an environmental impact statement is also required in connection with the construction license, *see* 10 C.F.R. § 51.20 (1982), the environmental impact statement at the operating license stage is primarily or wholly concerned with the physical effects of starting up a nuclear reactor. Similar physical effects occur during the restart of a reactor, such as TMI-1, that has been temporarily shut down. Third, there is, at least according to respondents' allegations before the Licensing Board, a causal nexus between the effect on the natural environment and human psychological health. And, finally, the effect on psychological health is a health effect the Commission itself assumes is cognizable under NEPA.

On this analysis, the only dispute between the Commission and respondents is whether there exists a causal nexus between the effect on the physical environment and the psychological stress experienced by those living near the reactor. That issue, however, is not a dispute of law but one of fact, and is not the type of issue that is ordinarily reviewed by this Court on writ of certiorari. Granting the petition on this fact issue would be particularly undesirable since the administrative record contains no finding whether restarting TMI-1 would, in fact, cause the type of psychological stress alleged by respondents. That issue is pending before the Commission now in its reopened proceedings, and evidence on the causality question has been presented to the Commission in those proceedings.

Considable research has already been done to determine the kind and amount of psychological stress experienced

by persons living near TMI.[19] In addition, efforts have been made to predict, on the basis of such studies and on

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[19] A Baum *et al.*, CHRONIC AND ACUTE STRESS ASSOCIATED WITH THREE MILE ISLAND ACCIDENT AND DECONTAMINATION, PRELIMINARY FINDINGS OF A LONGITUDINAL STUDY (Draft report submitted to USNRC 1981); A. Baum *et al.*, PSYCHOLOGICAL STRESS FOR ALTERNATIVES OF DECONTAMINATION OF THREE MILE ISLAND-2 REACTOR BUILDING ATMOSPHERE (USNRC Report 1980); Bromet & Dunn, *Mental Health of Mothers Nine Months After the Three Mile Island Accident*, 14 URBAN AND SOCIAL CHANGE REVIEW 12 (1981); E. Bromet *et al.*, PRELIMINARY REPORT ON THE MENTAL HEALTH OF THE THREE MILE ISLAND RESIDENTS (1980); Bromet, Schulberg & Dunn, *Reactions of Psychiatric Patients to the Three Mile Island Nuclear Accident*, ARCHIVES OF GENERAL PSYCHIATRY (in press); E. Bromet *et al.*, THREE MILE ISLAND: MENTAL HEALTH FINDINGS (NIMH Contract #278-79-0048(SM) 1980); Chisholm & Kasl, *The Effects of Work Site, Supervisory Status, and Job Function on Nuclear Workers' Responses to the TMI Accident*, JOURNAL OF OCCUPATIONAL BEHAVIOR (in press); Chisholm *et al.*, *Behavioral and Mental Health Effects of the TMI Accident on Nuclear Workers: A Preliminary Report*, 365 ANNALS OF THE NEW YORK ACADEMY OF SCIENCES 134 (1981); B. Dohrenwend *et al.*, REPORT OF THE TASK GROUP ON BEHAVIORAL EFFECTS, STAFF REPORTS TO THE PRESIDENT'S COMMISSION ON THE ACCIDENT AT THE THREE MILE ISLAND (U.S.G.P.O. 257-308 1979); C. Flynn, THREE MILE ISLAND TELEPHONE SURVEY, PRELIMINARY REPORT ON PROCEDURES AND FINDINGS (USNRC 1979); M. Goldhaber, P. Houts, & R. DiSabella, MOBILITY OF THE POPULATION WITHIN 5 MILES OF THREE MILE ISLAND DURING THE PERIOD FROM AUGUST 1979 THROUGH JULY 1980 (Report to TMI Advisory Panel on Health Research Studies of the Pa. Dept. of Health 1981); Governor's Office of Policy Planning, THE SOCIO-ECONOMIC IMPACTS OF THE THREE MILE ISLAND ACCIDENT: FINAL REPORT (1980); Houts & Goldhaber, *Psychological and Social Effects on the Population Surrounding TMI After the Nuclear Accident on March 28, 1979*, in ENERGY, ENVIRONMENT AND THE ECONOMY (S. Majumdar ed. 1981); P. Houts *et al.*, HEALTH-RELATED BEHAVIORAL IMPACT OF THE THREE MILE ISLAND NUCLEAR INCIDENT PARTS I AND II (Report to TMI Advisory Panel on Health Research Studies of the Pa. Dept. of Health 1980); P. Houts *et al.*, HEALTH RELATED BEHAVIORAL IMPACT OF THE THREE MILE ISLAND NUCLEAR INCIDENT PART III (Report to TMI Advisory Panel on Health Research Studies of the Pa. Dept. of Health 1981); Houts, DiSabella & Goldhaber, *Extent and Duration of Psychological Distress of Persons in the Vicinity of Three Mile Island*, 54 PROCEEDINGS OF THE PENNSYLVANIA

extrapolation from data on the psychological aftermath of other disasters, what additional stress would be caused by restarting TMI-1 on the site of the previous nuclear accident.[20]

Studies have also been undertaken concerning the psychological stress caused the high risk groups—mothers of young children,[21] plant workers[22] and psychiatric

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ACADEMY OF SCIENCES 22 (1980); T. Hu *et al.*, HEALTH-RELATED ECONOMIC COSTS OF THE THREE MILE ISLAND ACCIDENT (Report submitted to TMI Advisory Panel on Health Research Studies of the Pa. Dept. of Health 1981); Kasl, Chisholm & Eskenazi, *The Impact of the Accident at the Three Mile Island on the Behavior and Well-Being of Nuclear Workers: Part I. Perceptions and Evaluations, Behavioral Responses and Work-Related Attitudes and Feelings*, 71 AM. J. OF PUBLIC HEALTH 472 (1981); Kasl, Chisholm & Eskenazi, *The Impact of the Accident at the Three Mile Island on the Behavior and Well-Being of Nuclear Workers: Part II. Job Tension, Psychophysiological Symptoms, and Indices of Distress*, 71 AM. J. OF PUBLIC HEALTH 484 (1981); D. Mileti, D. Hartsough & P. Madsen, THE THREE MILE ISLAND INCIDENT: A STUDY OF BEHAVIORAL INDICATORS OF HUMAN STRESS (Report to Shaw, Pittman & Trowbridge, Legal Counsel to General Public Utilities and Metropolitan Edison, final report forthcoming); J. Morell & G. Spivak, REVIEW OF STUDIES ON THE PSYCHOLOGICAL AND BEHAVIORAL IMPACT OF THE TMI NUCLEAR ACCIDENT, WITH SPECIFIC IMPLICATIONS FOR RESEARCH AND PLANNING (Dept. of Mental Health Sciences, Hahnemann Medical College, unpublished 1980); D. Shearer, THREE MILE ISLAND NUCLEAR ACCIDENT COMMUNITY IMPACT STUDY ON REAL ESTATE (Greater Harrisburg Board of Realtors 1980).

[20] *See, e.g.*, Proceedings 39-46; R. Holt, A SELECTIVE REVIEW OF RESEARCH ON HEALTH EFFECTS OF THE ACCIDENT AT THREE MILE ISLAND (NIMH Contract #5-K06-MH-12455 1982).

[21] Bromet & Dunn, *Mental Health of Mothers Nine Months After the Three Mile Island Accident*, 14 URBAN AND SOCIAL CHANGE REVIEW 12 (1981).

[22] Chisholm & Kasl, *The Effects of Work Site, Supervisory Status, and Job Function on Nuclear Workers' Responses to the TMI Accident*, J. OF OCCUPATIONAL BEHAVIOR (in press); Chisholm *et al.*, *Behavioral and Mental Health Effects of the TMI Accident on Nuclear Workers: A Preliminary Report*, 365 ANNALS OF THE NEW YORK ACADEMY OF SCIENCES 134 (1981); Kasl, Chisholm &

patients[23]—as well as to the other residents within a five mile radius of the reactor.[24] These studies show acute short term stress reactions to the TMI accident which were qualitatively the same as fear reactions from other kinds of disasters[25] and quantitatively significant both

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Eskenazi, *The Impact of the Accident at the Three Mile Island on the Behavior and Well-being of Nuclear Workers: Part I. Perceptions and Evaluations, Behavioral Responses, and Work-Related Attitudes and Feelings*, 71 AM. J. OF PUBLIC HEALTH 472 (1981); Kasl, Chisholm & Eskenazi, *The Impact of the Accident at the Three Mile Island on the Behavior and Well-being of Nuclear Workers: Part II. Job Tension, Psychophysiological Symptoms, and Indices of Distress*, 71 AM. J. OF PUBLIC HEALTH 484 (1981).

[23] Bromet, Schulberg & Dunn, *Reactions of Psychiatric Patients to the Three Mile Island Nuclear Accident*, ARCHIVES OF GENERAL PSYCHIATRY (in press); E. Bromet *et al.*, THREE MILE ISLAND: MENTAL HEALTH FINDINGS (NIMH Contract #278-79-0048(SM) 1980).

[24] A. Baum *et al.*, CHRONIC AND ACUTE STRESS ASSOCIATED WITH THREE MILE ISLAND ACCIDENT AND DECONTAMINATION, PRELIMINARY FINDINGS OF A LONGITUDINAL STUDY (Draft report to USNRC 1981); A. Baum *et al.*, PSYCHOLOGICAL STRESS FOR ALTERNATIVES OF DECONTAMINATION OF THREE MILE ISLAND-2 REACTOR BUILDING ATMOSPHERE (USNRC Report 1980); C. Flynn, THREE MILE ISLAND TELEPHONE SURVEY, PRELIMINARY REPORT ON PROCEDURES AND FINDINGS (USNRC 1979); P. Houts *et al.*, HEALTH-RELATED BEHAVIORAL IMPACT OF THE THREE MILE ISLAND NUCLEAR INCIDENT PARTS I AND II (Report to TMI Advisory Panel, Pa. Dept. of Health 1980); P. Houts *et al.*, HEALTH-RELATED BEHAVIORAL IMPACT OF THE THREE MILE ISLAND NUCLEAR INCIDENT PART III, Report to TMI Advisory Panel, Pa. Dept. of Health (1981); Houts, DiSabella & Goldhaber, *Extent and Duration of Psychological Distress of Persons in the Vicinity of Three Mile Island*, 54 PROCEEDINGS OF THE PENNSYLVANIA ACADEMY OF SCIENCE 22 (1980); Warheit, Dohrenwend *et al.*, *Stress in the Community: A Report to the President's Commission of the Accident at Three Mile Island*, 365 ANNALS OF THE NEW YORK ACADEMY OF SCIENCES 159 (1981).

[25] Proceedings, *supra* xii-xiv; R. Holt, A SELECTIVE REVIEW OF RESEARCH ON HEALTH EFFECTS OF THE ACCIDENT AT THREE MILE ISLAND (NIMH Contract #5-K06-MH-12455 1982).

in terms of severity for individuals and incidence among area residents. Several studies have also shown long term low level chronic stress reactions in a significant portion of area residents.[26]

These studies have been received by the Commission staff. In addition, the Commission convened a meeting of prominent psychosocial researchers to consider the extent to which these and other studies could be used to predict the kind and amount of psychological stress which restart of the TMI-1 reactor might cause.[27] The group also considered ways in which adverse psychological reactions could be mitigated through community education, provision of mental health services and other measures.[28]

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[26] A. Baum *et al.*, CHRONIC AND ACUTE STRESS ASSOCIATED WITH THREE MILE ISLAND ACCIDENT AND DECONTAMINATION, PRELIMINARY FINDINGS OF A LONGITUDINAL STUDY (Draft report to USNRC 1981); A. Baum *et al.*, PSYCHOLOGICAL STRESS FOR ALTERNATIVES OF DECONTAMINATION OF THREE MILE ISLAND-2 REACTOR BUILDING ATMOSPHERE (USNRC Report 1980); Bromet & Dunn, *Mental Health of Mothers Nine Months After the Three Mile Island Accident*, 14 URBAN AND SOCIAL CHANGE REVIEW 12 (1981); E. Bromet *et al.*, THREE MILE ISLAND: MENTAL HEALTH FINDINGS (NIMH Contract #278-79-0048(SM) 1980); Houts, DiSabella & Goldhaber, *Extent and Duration of Psychological Distress of Persons in the Vicinity of Three Mile Island*, 54 PROCEEDINGS OF THE PA. ACADEMY OF SCIENCE 22 (1980); Kasl, Chisholm & Eskenazi, *The Impact of the Accident at the Three Mile Island on the Behavior and Well-being of Nuclear Workers: Part I. Perceptions and Evaluations, Behavioral Responses, and Work-Related Attitudes and Feelings*, 71 AM. J. OF PUBLIC HEALTH 472 (1981); Kasl, Chisholm & Eskenazi, *The Impact of the Accident at the Three Mile Island on the Behavior and Well-being of Nuclear Workers: Part II. Job Tension, Psychophysiological Symptoms, and Indices of Distress*, 71 AM. J. OF PUBLIC HEALTH 484 (1981).

[27] Proceedings 47-67.

[28] Proceedings 68-73. A systematic program of psychological intervention can reduce the impact of accidents on individuals, families and communities. State mental health agencies frequently are

There was agreement that additional studies should be undertaken and additional analysis of existing studies done to predict more accurately the long term chronic effects of anticipatory anxiety and exacerbated stress reactions at TMI.[29]

In these circumstances, consideration of the legal issue raised by the Commission would be premature. If the Commission ultimately determines that the physical effect of the federal action will in fact cause psychological stress of the type identified by the Court of Appeals, the legal issue upon which the Commission now seeks review will disappear. Moreover, the conflict in the circuits which the Commission claims was created by the Court of Appeals' decision will also evaporate. If, on the other hand, the Commission ultimately decides that the physical effects of the TMI-1 restart will *not* cause psychological effects of the type identified by the Court of Appeals, the issue upon which the Commission now seeks review will be sharply presented to the Court on the basis of a developed factual record. And the conflict in the circuits, if indeed one exists, would be clearly presented to the Court for resolution.

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involved in such planning for specific emergencies. The capacity of state and local resource systems should be taken into account when major federal actions are taken which have the potential of producing psychological injuries. K. Tienery & B. Baisden, CRISIS INTERVENTION PROGRAMS FOR DISASTER VICTIMS: A SOURCE BOOK AND MANUAL FOR SMALLER COMMUNITIES (DHEW Pub. #ADM 79-675 1975); R. Cohen & F. Ahearn, Jr., HANDBOOK FOR MENTAL HEALTH CARE OF DISASTER VICTIMS (1980).

[29] Proceedings 63-68.

CONCLUSION

The petitions should be denied.

Respectfully submitted,

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